SZULGA, Teofil; WIECZOREK, Zbigniow; MADRA, Janina

Reduction of activity of tuberosine after contact with suspensions of tubercle bacilli of various densities. Arch. immun. ter. dosw. 9 no.4:657-666 '61.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

(ANTITUBERCULAR AGENTS pharmacol)
(MYCOBACTERIUM TUBERCULOSIS pharmacol)

WIECZOREK, Zbigniew; SZULGA, Teofil

Electrophoretic separation of tuberosine. Arch. immun. ter. dosw. 9 no.4:667-671 '61.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

(ANTITUBERCULAR AGENTS chem) (ELECTROPHORESIS)

SKURSKI, Adam; MADRA, Janina; SZULGA, Teofil

The use of corpus vitreum from bovine eyeballs for the cultivation of tubercle bacilli in He-La cells. Arch. immun. ther. exp. 10 no.4:929-933 '62.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

(MYCOBACTERIUM TUBERCULOSIS)
(TISSUE CULTURE)
(VITREOUS BODY)

SZULGA, Teofil; MADRA, Janina; KOWALCZYK, Halina

Characterization of two atypical acid-fast strains isolated from clinical material. Arch. immun. ther. exp. 11 no.1/2:307-311 '63.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.
(MYCOBACTERIUM TUBERCULOSIS)

SZULGA, Teofil; MADRA, Janina; KOWALCZYK, Halina

Studies on differentiation of tubercle bacilli isolated from human beings, cattle and poultry. I. Morphologic and cultural characteristics. Arch. immun. ther. exp. 11 no.3:377-394 '63.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.
(MYCOBACTERIUM TUBERCULOSIS)
(MYCOBACTERIUM BOVIS)
(MYCOBACTERIUM)
(BACTERIOLOGICAL TECHNICS)
(CATTLE) (POULTRY)

SZULGA, Teofil; MADRA, Janina; KOWALCZYK, Halina

Studies on differentiation of tubercle bacilli isolated from human beings, cattle and poultry. II. Enzymic activity. Arch. immun. ther. exp. 11 no.3:395-403 '63.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

(MYCOBACTERIUM TUBERCULOSIS)
(MYCOBACTERIUM BOVIS)
(MYCOBACTERIUM)
(BACTERIOLOGICAL TECHNICS)
(CATALASE) (UREASE)
(PEROXIDASES) (NICOTINIC ACID)

METZGER, Mieczyslaw; SZULGA, Teofil

Lysozyme levels in the sera of guinea pigs and rabbits in the course of experimental tuberculosis. Arch. immun. ther. exp. 11 no. 3:489-497 '63.

1. Department of Protozoology and Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

(TUBERCULOSIS) (MURAMIDASE)
(ENZYME TESTS) (BLOOD CHEMICAL ANALYSIS)

METZGER, Mieczyslaw; SZULGA, Teofil

The lysozyme activity of the blood serum of guinea pigs and rabbits in experimental tuberculosis. Postepy hig.med.dosw. 17 no.6:725-729 N-D'63

1. Z Zakladu Protozoologii i z Zakladu Mykologii Instytutu Immunologii i Terapii Doswiadczalnej PAN im. L. Hirszfelda we Wroclawiu. Dyrektor: prof.dr.S.Slopek.

*

SZULGA, Teofil; MADRA, Janina; KOWALCZYK, Halina

Studies on differentiation of tubercle bacilli isolated from human beings, cattle and poultry. II. Enzymic activity. Arch. immun. ther. exp. 11 no.3:395-403 '63.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.
(MYCOBACTERIUM TUBERCULOSIS) (MYCOBACTERIUM)
(MYCOBACTERIUM BOVIS) (BACTERIOLOGICAL TECHNICS)
(CULTURE MEDIA) (CATALASE) (SULFATASES)
(UREASE) (PEROXIDASES) (POULTRY)
(NICOTINIC ACID) (CATTLE)

SKURSKI, Adam; SZULGA, Teofil; WACHNIK, Zenon; MADRA, Janina; KOWALCZYK, Halina.

Classification of acid-fast bacilli isolated from the milk of cows and from sewage used for fertilizing pastures. I. Pathogenic and saprophytic bacilli. Arch. immun. ther. exp. 13 no.2: 189-196 '65

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Chair of Epizootiology, School of Agriculture, Wroclaw.

WIECZOREK, Zbigniew; SKURSKI, Adam; SZULGA, Teofil; KEMPA, Bozena;
CZAJKA, Maria

Phagocytosis of atypical mycobacteria from various sources.
Arch. immun. ther. exp. 13 no.1:1-5 '65

Phagocytosis of acid-fast bacilli in the presence of human and animal sera. Ibid.:6-12

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

SZULGA, Teofil; SZARO, Alfred; MADRA, Janina; KOWALCZYK, Halina

Classification of acid-fast bacilli isolated from the milk of cows and from sewage used for fertilizing pastures. Pt.2. Arch. immun. ther. exp. 13 no.3:331-335 '65.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw; The Provincial Tuberculosis Dispensary in Wroclaw.

SZULGA, Teofil; WIECZOREK, Zbigniew; MADRA, Janina; KOWALCZYK, Halina

Classification of acid-fast bacilli isolated from the milk of cows and from sewage used for fertilizing pastures. Pt.3. Arch. immun. ther. exp. 13 no.3:336-343 '65.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

SZULGA, Teofil; SKURSKI, Adam; PELC, Wieslaw

Studies on the occurrence of the cord factor in atypical mycobacteria. Arch. immun. ther. exp. 13 no.3:344-354 '65.

1. Department of Mycology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

POLAND / Sanitary Microbiology. Sanitary Microbiology F-3
of Water.

Abs Jour: Ref Zhur-Biol., 1958, No 17, 76727.

Author : Paluch, Jan; Szulicka, Janina; Szymkiewicz, Aldona.
Inst : Not given.
Title : Investigation of Rapid Filters in Kozlovaya Gor.

Orig Pub: Gaz, woda, techn. sanit., 1957, 31, No 7, 250-256.

Abstract: No abstract.

Card 1/1

CABEJSZEK, Irena; RYBAK, Maria; SZULINSKI, Stanislaw; WOJCIK, Jozef

Attempt to determine permissible levels of metoxychlorine in water. Roczn. panstw. zakl. hig. 14 no.4:345-354 '65.

1. Z Zakladu Higieny Komunalnej Panstwowego Zakladu Higieny i z Katedry Higieny Osiedli AM w Warszawie (Kierownik: prof. dr. J. Just).

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

POLAND/Radio Physics - Propagation of Radio Waves. I

Abs Jour : Ref Zhur Fizika, No 12, 1959, 28128

Author : Szulkin, D.

Inst : -

Title : On the Reflection of Electromagnetic Waves in the Ionosphere with Vertical Sounding

Orig Pub : Bull. Acad. polon. sci. Ser. sci. techn., 1957, 7, No 1, 65-68

Abstract : An investigation was made of a solution that describes the reflection of radio waves from a linear layer. It is shown that at a small gradient of electron concentration, the reflection of the waves takes place in a very thin layer, containing a point in which the index of refraction of the inhomogeneous layer vanishes. -- N.G. Denisov

Card 1/1

SZULKIN, Elzbieta; [illegible]KA, Teresa

State (serial) control of lyophilized BCG vaccines. Med. dosw. mikrob. 11 no.1:77-84 1959.

1. Z Zakladu Badania Surowic i Szczepionek PZH Kierownik: prof. dr H. Meisel.

(BCG VACCINATION
state control of lyophilized vaccines in Poland (Pol))

SZULKIN, Elzbieta

Crohn's method in the application of glutamic acid medium for the evaluation of lyophilized BCG vaccine. Med.dosw.mikrob. 12 no.4: 369-374 '60.

1. Z Zakladu Badania Surowic i Szczepionek P.Z.H. Kierownik: prof.dr H.Meisel.
(BCG VACCINATION)
(GLUTAMATES)

POLAND

SPORZYNSKA, Zdzislawa, SZULKIN, Elzbieta, and KUDELSKI, Zygmunt; Department for Testing Sera and Vaccines (Zaklad Badania Surowic i Szczepionek), PZH [Panstwowy Zaklad Higieny, State Institute of Hygiene] in Warsaw (Director: Prof. Dr. H. MEISEL)

"Laboratory Tests of Immunological Properties of Polish Di-Te-Per Fluid Vaccine."

Warsaw, Medycyna Doswiadczalna i Mikrobiologia, Vol 15, No 3, 63, pp 189-198

Abstract: [Authors' English summary modified] Study aimed at devising a method for testing the diphtheria component of the fluid vaccine, determining its stability, and effect of season on animal reaction to it. Two 2.5 Lf doses were considered as optimum for immunization, and antitoxin level with account of survivors of animals challenged with proper dose of toxin was measure of immune response. Storage for 2-3 years did not diminish potency of preparation, and some variation was noted in animal response between spring and winter as against fall and summer. 1 Polish and 4 Western refs.

1/1

6

SZULKIN, Elzbieta; SPORZYNSKA, Zdzislawa; KUDELSKI, Zygmunt

Laboratory evaluation of immunogenic properties of non-adsorbed tri-vaccine Di-Te-Per produced in Poland. The tetanus component. Med. dosw. mikrobiol. 16 no.2:111-122 '64.

1. Z Zakladu Badania Surowic i Szczepionek Panstwowego Zakladu Higieny (Kierownik: prof. dr. H. Meisel).

IMMUNOLOGY

POLAND

SZULKIN, Elzbieta; Department of Control of Sera and Vaccines of the National Institute of Hygiene in Warsaw (Zaklad Badania Surowic i Szczepionek PZH)

"Comparative Laboratory Evaluation of Protective Properties of French and Brazilian BCG Substrains and Vaccines Produced from these Strains in Poland"

Warsaw, Medycyna Doswiadczalna Mikrobiologia, Vol 18, No 4, 1966; p. 345-352

Abstract [English summary modified]: Comparative study of French and Brazilian BCG strains and of Polish produced vaccine therefrom as tested in guinea pigs and rabbits, showed that either vaccine significantly prolonged the survival time in H37Rv-infected rabbits. Detailed data gave no clear indication of the superiority of either strain. Graph, diagram, 2 tables; 5 Polish, 13 Western references.

1/1

HUNGARY

SZULKIN, Emma

A case of chronic pulmonary infiltrations with eosinophilia. Polskie arch. med. wewn. 31 no.3:421-427 '61.

1. Z Oddzialu Chorob Wewnetrznych Instytutu Gruzlicy w Warszawie Kierownik Oddz: prof. dr med. W. Hartwig.

(LOEFFLER'S SYNDROME case reports)

POLAND

SZULKIN, Emma and PAWLICKA, Lila; Department of Internal Diseases (Oddzial Chorob Wewnetrznych), Institute of Tuberculosis (Instytut Gruzlicy), Director: Prof Dr Med B. JOCHWEDS; and Department of Radiology (Oddzial Radiologii), Institute of Tuberculosis, Director: Prof Dr Med K. OSSOWSKA.

''Bullous Emphysema in the Course of Staphylococcic Pneumonia in Adults. Case Report''

Warsaw, Polski Tygodnik Lekarski, Vol XVIII, No 6, 4 Feb 1963, pp 221-224

Abstract: /Authors' English summary modified/ A case of bullous emphysema in the course of staphylococcic pneumonia in an adult is reported. Antibiotic treatment and transfusions during 6 weeks led to complete clinical improvement. The signs of bullous emphysema decreased slowly and were observed even after 7 weeks. 1 table; 4 illustrations, 1 French, 11 Polish references.

1/1

SZULKIN, Emma; PAWLICKA, Lila

Bullous emphysema during the course of staphylococcal pneumonia in an adult. Pol. tyg. lek. 18 no.6:221-224 4 F '63.

1. Z Oddzialu Chorob Wewnetrznych Instytutu Gruzlicy; kierownik: prof. dr med. B. Jochweds i z Oddzialu Radiologii Instytutu Gruzlicy; kierownik: prof. dr med. K. Ossowska.
(STAPH INFECTIONS, RESPIRATORY) (PNEUMONIA)
(EMPHYSEMA) (BLOOD TRANSFUSION)
(ANTIBIOTICS)

POLAND

MÜLLER, Jerzy, SZULKIN, Emma, and KOWALSKI, Jan, Division of Internal Diseases (Oddzial Wewnetrzny) (Director: Prof. Dr. B. JOCHWEDS) and Department of Physiopathology (Zaklad Fizjopatologiczny) (Director: Dr. A. KOZIOROWSKI) of the Tuberculosis Institute (Instytut Gruzlicy) in Warsaw (Director: Prof. Dr. W. JAROSZEWICZ)

"On the Treatment of Hypercapnic Coma. Case Report."

Warsaw, Polski Tygodnik Lekarski, Vol 18, No 11, 11 Mar 63, pp 400-402.

Abstract: [Authors' English summary] A case of successfully treated hypercapnic coma is reported. The treatment of acute respiratory failure, chronic therapy, and prophylaxis are discussed. The 23 cited references comprise three (3) Polish and 20 references in English.

1/1

OSSOWSKA, Krystyna; SZULKIN, Emma

Chronic tuberculous mediastinitis. Gruzlica 31 [illegible]

1. Z Instytutu Gruzlicy Zaklad Radiologii Kierownik: prof. dr med. K. Ossowska Oddzial Wewnetrzny Kierownik: prof. dr med. B. Jochweds Dyrektor: prof. dr med. W. Jaroszewicz.

(MEDIASTINUM) (TUBERCULOSIS)
(TUBERCULOSIS, LYMPH NODE)
(VENA CAVA, SUPERIOR)
(VASCULAR DISEASES)

SZMIGIELSKI, Michal; SZULKIN, Emma; NAPIORKOWSKA, Wanda

SZULKIN, Emma; KOWALCZYK, Maria; STYSZEWSKA, Hanna

Sermoucoid in viral hepatitis patients. Pol. tyg. lek. 19 no.32:1230-1232 10 Ag '64.

1. Z Oddzialu Chorob Wewnet- nych Instytutu Gruzlicy (kierownik: prof. dr med. B. Jochweds,) z II Kliniki Chorob Zakaznych Akademii Medycznej w Warszawie (kierownik: prof. dr med. B. Kassur) i z Zakladu Chemii Klinicznej Instytutu Gruzlicy (kierownik: dr A. Wolanska).

ROWINSKA, Ewa; SZULKIN, Emma; STYSZEWSKA, Hanna

Influence of the extent and dynamics of tuberculous changes and coexisting diseases on the seromucoid level in pulmonary tuberculosis patients. Gruzlica 33 no.9:749-757 S '65.

1. Z Kliniki Chorob Pluc (Kierownik: doc. dr. P. Krakowska); z Kliniki Chorob Wewnetrznych (Kierownik: prof. dr. B. Jochweds) i z Zakladu Biochemii Klinicznej (Kierownik: dr. A. Wolanska) Instytutu Gruzlicy.

SZULKIN, Michal

Tenth anniversary of the death of engineer Jozef Pruchnik. Gosp wodna 22 no.1:28-31 '62.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

SZULKIN, P.

4239. THE MUTUAL INTERACTION OF THE ELECTRO-[illegible] MAGNETIC FIELD IN A CYLINDRICAL CAVITY RESONATOR [illegible] PRESENCE OF A MAGNETIC FIELD. P. Szulkin.
Arch. Elektrotech. (Warsaw), Vol. 4, No. 4, 577-83 (1955). In Polish.

SHUL'KIN, Pavel., professor; MALETSKIY, Ignatsy, professor

Radio in the people's Poland. Radio no.11:18-19 N'55. (MLRA 9:1)
(Poland--Radio)

SZULKIN, P.

Poland/Radiophysics - Superhigh Frequencies, I-11

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35411

Author: Szulkin, P.

Institution: None

Title: Excitation of Cavities by a Beam of Electrons, Density-Modulated

Original Periodical: Arch. Elektrotechniki, 1956, 5, No 1, 149-208; Polish; Russian and English resumés

Abstract: Investigation of the excitation of cavities by density-modulated electron beam, the cross section of which equals the cross section of the cavity. The variation of the natural frequencies of the cavity, produced by the presence of the beam is determined, as is the effect of the various factors on the amplitude of the oscillations. It is established as a result of the investigation that detuning the cavity may reach several percent and that the amplitude of the oscillations is affected by the following factors: degree of excitation, average current density, velocity of electron

Card 1/2

POLAND/Radio Physics - Propagation of Radio Waves I-5

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 21118

Author : Szulkin P.
Inst : Not Given
Title : Effect of Refraction and Electric Parameters of the Earth on the Propagation of Electromagnetic Waves in a Diffractive Region

Orig Pub : Bull. Acad. polon. sci., 1957, Cl. 4, 5, No 5, 295-300, XXVII

Abstract : Description of a method of determining the field of terrestrial waves in the shadow region for arbitrary values of the equivalent radius of the earth's sphere, using a set of curves of the field intensity of the terrestrial waves, plotted for normal atmospheric refraction. Analyzing the Bremer-van der Pol diffraction formula, the author establishes that replacing the previous value of the equivalent earth's radius by a certain new value is equivalent to changing over to new values of wave lengths, distance, and height of the antenna (retaining the previous value of the

Card : 1/2

POLAND/Radio Physics - Propagation of Radio Waves I-5

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 21119

Author : Szulkin P.
Inst : Not Given
Title : Effect of Antenna Height on Ultrashort Wave Field Intensity in a Diffractive Region. I. Case of Low Antennae.

Orig Pub : Bull. Acad. polon. sci., 1957, Cl. 4, 5, 301-306 XXVII

Abstract : It is known that at low antenna heights, theheight factors of the diffraction formula for the shadow region is independent of the serial number of the summed waves. In order to determine the limits of applicability of this approximation, the author, using the asymptotic expressions for the Henkel function, establishes an approximate expression for the height factors, coinciding with those previously obtained by Bremer. It is shown that the dependence of the height factors on the height above the surface of the earth is characterized by the existence of the minimum, particularly noticeable in propagation over sea water. In propagation over moist soil, there is no minimum.

Card : 1/1

I-5

POLAND/Radio Physics - Propagation of Radio Waves

Abs Jour : Ref Zhur - Fizka, No 11, 1958, No 25871

Author : Szulkin F.
Inst : Not Given
Title : Effect of Antenna Height on the Magnitude of the Ultra Short-wave Field in a Diffractive Region. II. Case of High Antennas.

Orig Pub : Bull. Acad. Polon. sci., 1957, Cl. 4, 5, No 6, 351-356, XXXII

Abstract : From the general formules, obtained by Bremmer, with the aid of asymptotic representation of the function $H^{(2)}_{1/3}$ for large values of the argument, the author derives expressions for the gain of the antenna as a function of its height, and also for the electric field intensity as a function of the aperture heights of the receiving and transmitting antennas. The formules obtained are valid in the diffraction region for antenna heights $H \geq 60 \lambda^{2/3}$ where λ is the wavelength (for the case of small antenna heights see Referat Zhur Fizika,

Card : 1/2

40

5 = 4), and the wavelength varies from 1 to 10 meters. The calculated values of the field differe from those obtainedby means of exact formules (with the aid of an electronic computer) by not more then 0.5 to 0.7 decibles.

Card : 2/2

I

POLAND/Radio Physics - Propagation of Radio Waves.

Abs Jour : Ref Zhur Fizika, No 8, 1959, 18625

Author : Szulkin, P.
Inst : -

Title : Propagation of Plane Electromagnetic Wave in Non-Conducting Medium with Linearly-Decreasing Dielectric Constants

Orig Pub : Bull. Acad. polon. sci. Ser. Sci. techn., 1958, 6, No 4, 241-244

Abstract : The author considers the propagation of a plane wave, normally incident from vacuum onto a stratified inhomogeneous non-absorbing layer. The dielectric constant of the inhomogeneous layer, ε, varies linearly from $\varepsilon = 1$ at the lower boundary to $\varepsilon = 0$ on the upper boundary. Adjacent to the layer, beyond it, is a region where $\varepsilon < 0$. A value of the reflection coefficient is obtained and it is shown that $|R| = 1$.

Card 1/1

SZULKIN, Pawel

The function of the correlation between the output of linear systems and the input in the form of incidental noise of limited bandwidth. Archiw automat 4 no.3/4:319-327 '59. (EEAI 9:7)

1. Polska Akademia Nauk
(Electronic control) (Servomechanisms)
(Least squares)

SZULKIN, P.

A variational method applied to the analysis of a ridge-wave guide. Bul Ac Pol tech 7 no.10:573-579 '59. (EEAI 9:7)
(Wave guides) (Calculus of variations)
(Radio) (Functions)

SZULKIN, P.

Matrix form of the equiations of propagation in an anisotropic medium with a constant magnetic field. Bul Ac Pol tech 7 no.10: 581-587 '59. (EEAI 9:7)

(Electromagnetic waves)
(Magnetism, terrestial)
(Ionospheric radio wave propagation)

SZULKIN, P.

Conditions for laminar flow of a focused electron beam. Bul Ac Pol tech 7 no.11:651-654 '59. (EEAI 9:6)
(Electron beams) (Laminar flow)

SZULKIN, P.

Approximation of arbitrary characteristics of band amplitudes.
Bul Ac Pol tech 7 no.12:679-688 '59. (EEAI 9:6)
(Electric circuits) (Approximate computation)
(Series) (Radio)

POL/19-8-1-7/14

9(3,9)
AUTHOR: Szulkin, P.

TITLE: Graphical Method of Calculating the Earth's Surface Reflection Coefficient

PERIODICAL: Archiwum Elektrotechniki, 1959, Vol 8, Nr 1, pp 97-102 (Poland)

ABSTRACT: The calculation of the complex coefficient of electromagnetic wave reflection is usually very cumbersome. This is particularly true if the dielectric constant and the conductibility of the reflecting medium change with the frequency. This should be taken into account in the case of ultra short waves for example. The article shows, on the basis of certain approximations, a graphical method enabling the prompt and adequate determination of the reflection coefficent for the incident wave with a vertical as well as a horizontal polarization. There are 4 diagrams.

SUBMITTED: May 10, 1958
Card 1/1

67167

The Goubau Surface Wave Theory POL/19-8-2-6/14

tropic properties. At the same time it is assumed that there are no losses in the electromagnetic field. These can be taken into account only in calculating the efficiency of transferring energy through the surface wave along its own peculiar line of transmission. The admissibility of such an interpretation is unquestioned where losses are only small. Since, as has been established, losses accompanying the propagation of the surface wave are very small, the above assumptions can be accepted without reservation. The Goubau wave has its own axial symmetry. Practically speaking, the radial range of the field is finite and during undisturbed propagation there are no power losses due to radiation. These characteristics are very valuable from the point of view of practical application. From these considerations, starting with Maxwell's equation and introducing Bessel's Hankel's and Neumann's function, the author derives the equation

$$\frac{\varepsilon_0 - \varepsilon_1}{\varepsilon_1}\left(\frac{a'}{\lambda_0}\right)^2 \ln\frac{a'}{a} = \left(\frac{\gamma a'}{2\pi}\right)^2 \ln\left(0.89\,\gamma a'\right)$$

Card 2/3

where ε_0 and ε_1 = the external and internal dielectric constants; a' = the external radius of the internal dielectric film; a = the radius of the conductor; $Z_0 = \frac{1}{2\sqrt{\mu_0 \varepsilon_0}}$ and $h_0^2 = \gamma^2 - k_0^2$ where γ = the phase constant and $k_0 = \frac{\omega}{c}$. From there the author derives an expression for the section of power flow and losses

[illegible]

where [illegible] = tangent of dielectric losses. This expression gives the damping per unit of length of the line, caused by losses in the internal dielectric surface. There are 1 graph and 3 references, 1 of which is English and 2 German.

SUBMITTED: February 4, 1959

6(0), 9(0) POL/19-8-3-1/10

AUTHOR: Szulkin, P.

TITLE: Electromagnetic Wave Propagation along the Slot in a Cylindrical Surface

PERIODICAL: Archiwum elektrotechniki, 1959, Vol 8, Nr 3, pp 355-367 (Poland)

ABSTRACT: The slot antenna which is considered in this article is made up of a long slot cut in a cylindrical surface and activated to make a wave run along its length. In practice this may be achieved with a wave conductor incorporating an axial slot open towards the side restricted by the cylindrical surface (Fig 1). It is assumed that the slot and the cylinder are of infinite length, that the walls are perfect conductors and that the dielectric environment is everywhere homogeneous and involves no losses. It is further assumed that the wave conductor and the external cylinder are the surfaces of coordinates of two systems of ortogonal, generalized cylinder coordinates of which one relates to the internal area and the

Card 1/4

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

POL/19-8-3-1/10

Electromagnetic Wave Propagation along the Slot in a Cylindrical Surface

other to the external area. From there, the author considers any given field, which he takes to be the sum of the electrically transverse field and the magnetically transverse field. Substituting Hertz vectors, the author reaches the conclusion that any such field corresponds physically to propagation only in the direction of the axis with the speed of light (with k=0), the field being electromagnetically transversal. Hence the conclusion that the electrically transversal (TE) and magnetically transversal (TM) fields each separately fulfil "edge" conditions and are therefore mutually independent. From here the author proceeds to derive formulae for the fields TE and TM, introducing the corresponding Green functions. The proposed variational method consists of solving the problem of scalar potential from the linear source in the internal and external areas, which fulfils the imposed "edge" conditions on the walls

Card 2/4

POL/19-8-3-1/10

Electromagnetic Wave Propagation along the Slot in a Cylindrical Surface

of the wave conductor and the cylinder. The derived formulae are as follows:

in the case of TE $\sum_{n=0}^{\infty} \delta_n \frac{1}{J_n'(ka) H_n^{(2)'}(ka)} \int_{slot} E_\varphi^{(e)}(\varphi') d\varphi' \int_{slot} E_\varphi^{(e)}(\varphi)$

$$\cos n(\varphi - \varphi') \, d\varphi = 0$$

in the case of TM $\sum_{n=0}^{\infty} \delta_n \frac{1}{J_n(ka) H_n^{(2)}(ka)} \int_{slot} E_z^{(m)}(\varphi') d\varphi' \int_{slot} E_z^{(m)}(\varphi)$

$$\cos n(\varphi - \varphi') \, d\varphi = 0$$

where E and H are the electric and magnetic fields, φ and z the axial and ortogonal coordinates respec-

Card 3/4

POL/19-8-3-1/10

Electromagnetic Wave Propagation along the Slot in a Cylindrical Surface

tively, the other non-functional terms not being defined in the text. To determine the constant of propagation, the variational method makes it possible to obtain an arbitrary accuracy, even when only the approximate field distribution in the slot is known. There are 4 diagrams and 3 references, 1 of which is Soviet and 2 English.

SUBMITTED: April 30, 1959

Card 4/4

S[illegible], I.

Efficiency of directional receiving antennas. p. 93.

PRZEGLAD TELEKOMUNIKACYJNY. (Stowarzyszenie Elektrykow Polskich. Sekcja Telekomunikacyjna) Warszawa, Poland. Vol. 32, No. 3, March 1959.

Monthly List of East European Accessions (EEAI) LC. Vol. 8, no. 7, July 1959.

Uncl.

SZULKIN, Pawel

The impulse transient function of time-varying linear systems.
Archiw automat 5 no.1:35-43 '60. (EEAI 9:6)

1. Polska Akademia Nauk.
(Transients (Electricity))(Functions)
(Integrals)

P/031/60/005/003/002/004
A224/A026

16.9500

AUTHOR: Szulkin, Paweł

TITLE: The Stability Analysis of a Control System Including an Amplifier With a Loop Characteristic

PERIODICAL: Archiwum Automatyki i Telemechaniki, 1960, Vol. 5, No. 3, pp. 303-311

TEXT: The author analyzes an automatic control system including a nonlinear amplifier with a loop characteristic. The amplifier gain depends both on the sign of the input signal as well as on the sign of its time derivative. The analysis is conducted with the use of the describing function. The results are represented in 12 figures. The author concludes that the introduction of the nonlinear amplifier with a loop characteristic may have stabilizing properties in some cases, and may improve the properties of some linear systems. This amplifier acts as a phase shifter with a constant angular lead for all frequencies. The amplifier disadvantage is the restriction of its phase lead by the value φ_{1max} being equal to 32°30'. There are 13 figures and 2 Polish references.

√B

ASSOCIATION: Polska Akademia Nauk (Polish Academy of Sciences)
SUBMITTED: October 1, 1951

Card 1/1

SZULKIN, P.

Relation between the implse response of the parametric system and the theory of differential equations. Bul Ac Pol tech 8 no.1:15-21 '60. (EEAI 9:7)

(Electric networks) (Differential equations)

SZULKIN, P.

The electromagnetic field in an infinite plane horn. Bul Ac Pol. tech 8 no.1:23-28 '60. (EEAI 9:7)
(Electromagnetic fields) (Wave guides)

SZULKIN, P.

On energetic criteria of amplitude stability of oscillations.
Bul Ac Pol tech 8 no.2:83-91 '60. (EEAI 9:7)
(Oscillators, Electric)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

SZULKIN, P.

On the mean-square error spectrum. Bul Ac Pol tech 8 no.3:145-157 '60. (EEAI 9:11)

(Spectrum analysis)

SZULKIN, P.

On forced vibrations in a nonlinear system with many degrees of freedom. Bul Ac Pol tech 8 no.5:225-232 '60. (EEAI 9:10)
(Vibration)

SZULKIN, P.

The effect of soil upon the impedence of an antenna. Bul Ac Pol tech 8 no.5:233-240 '60. (EEAI 9:10)

(Impedance (Electricity))
(Soils)
(Electromagnetic waves)

SZULKIN, P.; KACPRZYNSKI, B.

Comparative analysis of approximate methods in the vibration theory. Bul Ac Pol tech 8 no.7:361-370 '60. (EEAI 10:3)

1. Communication Theory Department, Institute of Basic Technical Problems, Polish Academy of Sciences. Presented by P.Szulkin.
(Vibration)

SZULKIN, P.

Analysis of a rectangular resonator in a wave guide. Bul Ac Pol Tech
8 no.8:437-449 '60. (EEAI 10:6)
(Wave guides) (Resonators)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

SZULKIN, P.

On a system of two arbitrarily coupled dipoles, excited with a plane wave. In French. Bul Ac Pol tech 8 no.9:509-514 '60.
(EEAI 10:7)

(Dipole antennas) (Waves)

SZULKIN, P.

The variational principle in the theory of the cylindrical antenna.
Bul Ac Pol Tech 8 no.10:579-585 '60.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

SZULKIN, P.

On the integral equation of diffraction. Bul Ac Pol Tech 8 no.10: 587-593 '60.

SZULKIN, P.

On the interference of pulse signals with reflection form a plane.
Bul Ac Pol Tech 8 no.11/12:629-637 '60.

S/194/62/000/002/066/096
D290/D301

9.1310

AUTHOR: Szulkin, P.

TITLE: On the theory of the open resonator

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 2, 1962, 24, abstract 2Zh165 (Bull. Acad. polon. sci. Sér. sci. techn., 1960, 8, no. 11-12, 639-645)

TEXT: The author studies qualititatively the resonator that is formed by two parallel perfectly-conducting discs; he expresses the electromagnetic field between the parallel planes in a system of cylindrical coordinates. He introduces a radial impedance that has a certain value at the edge of the resonator. The field is divided into oscillatory and radiated parts; a Bessel function represents the oscillatory electric and magnetic fields, while a Hankel function represents the radiated fields. It is assumed that the radial components of the electric and magnetic fields vanish at the edge of the resonator; therefore, a rough approximation for the radial wave number of this mode is given by the E-mode of the corresponding hollow resonator. /Abstracter's note: Complete translation./

Card 1/1

33578
S/194/61/000/012/088/097
D271/D301

9,1000

AUTHOR: Szulkin, P.

TITLE: Synthesis of characteristics of linear antenna systems

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 40-41, abstract 12I229 (Prace Przemysł. inst. telekomun., 1960, v. 10, no. 30, 15-30)

TEXT: Synthesis of antenna systems does not lead to a single-valued solution of the problem. This means that for a given system there are many possibilities of element excitation, all of which produce identical a space effect. Using a polynomial representation of the function, a fundamental theory of linear systems can be derived; its general lines are given in 10 theorems. This approach does not, however, lead to a simple and direct method for the synthesis of characteristics. On the other hand, the method of analogues makes it possible to obtain readily, by using consecutive approximations, the location of roots in the complex plane which are needed for the required characteristic. By transforming

Card 1/3

33578
S/194/61/000/012/088/097
D271/D301

Synthesis of characteristics ...

well. Two other methods for the synthesis are considered in the conclusion; these do not require any supplementary assumptions regarding phase characteristics of the space factor. The practical value of these methods is limited because of computing difficulties. 9 references. [Abstractor's note: Complete translation.]

Card 3/3

SZULKIN, Pawel, prof.

Polish-Soviet scientific cooperation. Przegl techn 81 no.19: 27-28 '60.

1. Zastepca sekretarza naukowego Polskiej Akademii Nauk.

(14)

139

Warsaw, Archiwum Automatyki i Telemechaniki, Vol 6, No 4, 1961.

1. "An Equalizer Using a Delay-Line," Pawel SZULKIN and Bogdan KACPRZYNSKI; PP 371-388 (English summary).

2. "Analysis of Ashby's Homeostat As A Complex Control System," Zdzislaw BUBNICKI; PP 389-[illegible] (English summary).

3. "Some Applications of Decoding Systems of Complementary Type with the Directional Elements," J. BROMIRSKI; PP 399-408 (English summary).

4. "Digital Signal Parameters in Telemechanics," Jan FELICKI; PP 409-421 (English summary).

5. "On a Certain Method of Analysis of Relay-Contact Networks," Adam ZUCHOWSKI; PP 423-434 (English summary).

6. "Some Characteristics of a Pulse Controlled DC Motor," Jakub GUTENBAUM; PP 435-452 (English summary).

7. "An Analysis of Follow-up System Operating with DC Motor Controlled by Pulse Duration Modulation," Jakub GUTENBAUM; PP 453-462 (English summary).

8. "On Properties of the Thyratron Inverse-Parallel Circuit with Inductive Load," Jerzy LUCINSKI; PP 463-471 (English summary).

9. "Load Characteristics of Even Harmonic Magnetic Amplifiers," Jan KULIKOWSKI and Kazimierz MALANOWSKI; PP 473-492 (English summary).

10. "A Study of Control Properties of Counter-Current Heat Exchanger with One Medium Variable Flow," Zdzislaw TRYBALSKI; PP 493-510 (English summary).

11. "Self-Compensating Ability of Radiated Steam Generator with Natural Water Circulation," Wlodzimierz WIERZYNSKI; PP 511-532 (English summary).

12. "Transient Temperature Distribution of the Parallel Flow Heat Exchanger," Wieslaw CIECHANOWICZ; PP 533-540 (English summary).

— 1/2 —

SZULKIN, P.

32207
P/031/61/006/004/001/010
D242/D301

16.8000 (1103, 1031, 1132)

AUTHOR: Szulkin, Paweł, and Kacprzyński, Bogdan

TITLE: Application of delay lines as equalizers in control systems

PERIODICAL: Archiwum automatyki i telemechaniki, v. 6, no. 4, 1961, 371-388

TEXT: The authors investigate the possibility of applying delay lines as a correcting element for distortions in control systems, discussing polynomial, harmonic and dynamic classes of equalizers. The three classes are very similar and consist of a delay line with an approximate number of tappings and amplifiers and a summing element. A polynomial equalizer is defined by

$$C_k(s) = K_0 + K_1 e^{-T_1 s} + K_2 e^{-T_2 s} + \dots + K_n e^{-T_n s} = \sum_{i=0}^{i=n} K_i e^{-T_i s} \qquad (7)$$

Card 1/2

32207
P/031/61/006/004/001/010
D242/D301

Application of delay...

and a figure, and the effects of an equalizer on the response characteristics; it is illustrated by a numerical example. A harmonic equalizer is very similar to the polynomial. The parameters of both systems differ only by a few percent. Harmonic equalizers are much simpler to calculate since they are based on harmonic functions and form a convenient starting point for calculating polynomial equalizers. Since parameters differ by only a small margin, it is possible to use harmonic equalizers for more ambitious schemes offered by polynomial equalizers. For the best approximations of functions, the delay time should be short with a great number of tappings. However, generally, the shorter the delay time, the greater the amplification necessary. The dynamic equalizer is also similar to the polynomial, but a new condition is added. The transient response time is to be less than the delay time of a complete line. There are 14 figures and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: Yu-Chi-Ho, IRE Convention Theory, Part 4, 24-26 (1955).

SUBMITTED: November 16, 1960

Card 2/2

SZULKIN, PAWEL

SURNAME, Given Names

(1)

Country: POLAND

Academic Degrees: / not given/

Affiliation: / not given/

Source: Warsaw, Rozprawy Elektrotechniczne, Vol VII, No 2, 1961, pp 199-244

Data: " Approximation Problems in the Theory of Low-pass RC Filters"

Authors:

SZULKIN, Pawel

NOREK, Czeslaw

36

GPO 981643

S/194/62/000/006/153/232
D201/D308

AUTHOR: Szulkin, Paweł

TITLE: Variational method of design of discontinuities of a coaxial cable

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract 6Zh136, 20 (Rozpr. elektrotekhn. 1961, 7, no. 3, 365-379)

TEXT: The well-known variational method (L. Levin, Sovremennaya teoriya volnovodov (Modern Waveguide Theory) Izd-vo in. lit., 1954) is applied to the design of plane discontinuities in a coaxial transmission line. Having carried out calculations typical for the above method the author obtains an expression for conductivity. In the particular case of a stepped change in the diameter of the coaxial line in which only a wave of TEM type propagates, the calculations are carried out to the end. It is shown that in zero approximation such discontinuities are well represented by a capacitance shunting the line. Owing to its stationary properties the zero approximation is sufficiently accurate. [Abstracter's note: Comple-
Card 1/2

S/194/62/000/006/153/232
D201/D308

Variational method of design of ...

te translation.]

Card 2/2

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

SZULKIN, Pawel

Outlook for the development of a young scientific team.
Nauka Pol 9 no.4:31-45 O-D '61.

1. Czlonek rzeczywisty Polskiej Akademii Nauk, czlonek Komitetu Redakcyjnego czasopisma "Nauka Polska".

40309

S/194/62/000/006/058/232
D295/D308

16,8000

AUTHOR: Szulkin, P.

TITLE: The mean-square error [spectrum] as an optimization criterion

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract 6-2-136 a (Bull. Acad. polon. sci., Ser. sci. techn., 9, no. 7, 1961, 441-446)

TEXT: It is pointed out that the mean-square error can be considered as a system-performance index, optimum system characteristics being attained for a minimum value of the mean-square error. The analysis is carried out for the case when each frequency component of the spectrum is minimized. This leads to the optimum transfer function being determined by the input-signal spectrum and the noise spectrum. The system with such optimum transfer function is a system having the smallest value of the mean-square error for all possible input-signal spectra. 4 references. [Abstracter's note: Complete translation.]

Card 1/1

30566
P/019/61/010/001/001/006
D223/D305

9,1300

AUTHOR: Szulkin, P.

TITLE: Analysis of sharp discontinuities in waveguides by the method of infinite matrices

PERIODICAL: Archiwum elektrotechniki, v. 10, no. 1, 1961, 39 - 55

TEXT: The case of waveguide constriction is examined and EM fields on both sides of the discontinuity are expressed by an infinite number of modes, propagated in two directions. For each mode and direction there exists a coefficient which expresses the relative mode amplitude. Since the field components at discontinuities must be matches on the metal wall, the components E_x, E_y, H_z are equal to zero. These conditions lead to equations in variables x and y which may be eliminated by the method of the Fourier series. The infinite system of linear equations giving the mode coefficient is then transformed into a matrix equation with infinite column matrices. The answer is obtained by solving this matrix equation for the mode coefficient columns with consideration of all

Card 1/8

30566
P/019/61/010/001/001/006
D223/D305

Analysis of sharp discontinuities ...

boundary conditions. The method of interlacing is explained in the appendix. Interlacing allows one to represent the mode coefficient as a matrix. Table D-I shows an infinite square matrix when each element is defined by one suffix instead of two, thus element $TE_{2,1}$ is replaced by TE_7, $a_7 = a_{2,1}$. However, since modes $TE_{0,\ 0}$ and $TM_{0,\ 0}$ do not exist, the first element of the infinite series has suffix 1. The two matrix equations D-13 and D-14 4

$$\lfloor u \rfloor = \lfloor A \rfloor \lfloor x \rfloor + [B] \lfloor y \rfloor, \tag{D-13}$$

$$\lfloor v \rfloor = \lfloor C \rfloor [x] + \lfloor D \rfloor \lfloor y \rfloor, \tag{D-14}$$

where $\lfloor u \rfloor$, $\lfloor v \rfloor$, $\lfloor x \rfloor$ and $\lfloor y \rfloor$ are column matrices may be reduced to one equation by interlacing. Let column matrices W and Z may be defined by

$$W_{2m-1} = u_m \quad (m = 1.2,3 \ldots\ldots) \tag{D-15}$$

$$W_{2m} = v_m \tag{D-16}$$

and $Z_{2m-1} = x_m$ and $Z_{2m} = y_m$ (m = 1, 2, 3 ...); also let matrix $\lfloor E \rfloor$

Card 2/8

Analysis of sharp discontinuities ...

be defined by

$$E_{2m-1,2n-1} = A_{m,n} \quad (m,n = 1,2,3\ldots\ldots) \tag{D-17}$$

$$E_{2m-1,2n} = B_{m,n} \tag{D-18}$$

$$E_{2m,2n-1} = C_{m,n} \tag{D-19}$$

$$E_{2m,2n} = D_{m,n} \tag{D-20}$$

Then

$$\lfloor W \rfloor = [E]\lfloor Z \rfloor \tag{D-21}$$

where

$$[E] = \begin{bmatrix} [A] & [B] \\ [C] & [D] \end{bmatrix}. \tag{D-22}$$

4

The initial equation of E_x for a waveguide with a sharp discontinuity on both sides of it are represented by

$$E_{xI} = \sum_{m,n=0}^{\infty} \left\{ \left(\frac{j\omega\mu}{k^2_{m,n}}\right)\left(\frac{n\pi}{b}\right)\left[a_{m,n}e^{-\gamma_{m,n}z} + b_{m,n}e^{+\gamma_{m,n}z}\right] - \right.$$
$$\left. -\left(\frac{\gamma_{m,n}}{k^2_{m,n}}\right)\left(\frac{m\pi}{a}\right)\left[c_{m,n}e^{-\gamma_{m,n}z} + d_{m,n}e^{+\gamma_{m,n}z}\right]\right\} \cos\left(\frac{m\pi x}{a}\right)\sin\left(\frac{n\pi y}{b}\right) \tag{1}$$

30566
P/019/61/010/001/001/006
D223/D305

Analysis of sharp discontinuities ...

$$E_{xII} = \sum_{p,q=0}^{\infty} \left\{ \left(\frac{j\omega\mu}{k'^2_{p,q}}\right)\left(\frac{q\pi}{b'}\right)\left[a'_{p,q}e^{-\gamma'_{p,q}z} + b'_{p,q}e^{+\gamma'_{p,q}z}\right] - \left(\frac{\gamma'_{p,q}}{k'^2_{p,q}}\right)\left(\frac{p\pi}{a'}\right)\left[c'_{p,q}e^{-\gamma'_{p,q}z} + d'_{p,q}e^{+\gamma'_{p,q}z}\right]\right\} \cos\left[\frac{p\pi(x-c)}{a'}\right]\sin\left[\frac{q\pi(y-d)}{b'}\right] \tag{2}$$

4

$$k^2_{m,n} = \left(\frac{m\pi}{a}\right)^2 + \left(\frac{n\pi}{b}\right)^2; \quad k'^2_{p,q} = \left(\frac{p\pi}{a'}\right)^2 + \left(\frac{q\pi}{b'}\right)^2 \tag{3}$$

$$\gamma_{m,n} = \sqrt{k^2_{m,n} - \omega^2\mu\varepsilon}; \quad \gamma'_{m,n} = \sqrt{k'^2_{p,q} - \omega^2\mu\varepsilon} \tag{4}$$

where all quantities have the usual meaning and a_{ik}, b_{ik}, c_{ik} and d_{ik} are mode coefficients of TE and TM components in the positive and negative direction of z. Similar equations may be written for other field components on both sides of the discontinuity. The boundary conditions ($z = 0$, $E_x = E_y = H_z = 0$) lead to a set of 4 equations, in which the field components E_z, H_x and H_y do not

Card 4/8

appear. By applying Fourier's method the space coordinates x and y are eliminated. Finally, the equations are represented in the form

$$[a] + [b] = [G] \quad [[a'] + [b']] \tag{50}$$

$$[c] + [d] = [H] \quad [[a'] + [b']] + [K] \quad [[c'] + [d']] \tag{51}$$

$$[a'] - [b'] = [M] \quad [[a] - [b]] + [N] \quad [[c] - [d]] \tag{52}$$

$$[c'] - [d'] = [P] \quad [[c] - [d]] \tag{53}$$

where $[a]$, $[b]$, $[c]$, $[d]$, $[a']$, $[b']$, $[c']$ and $[d']$ are infinite column matrices and $[G]$, $[H]$, $[K]$, $[M]$, $[N]$ and $[P]$ are infinite square matrices. By applying interlacing method the following pairs are combined: a-c into α, b-d into β, a'-c' into η and b'-d' into γ. Assuming

$$[W] = \begin{bmatrix} [G] & [0] \\ [H] & [K] \end{bmatrix} \tag{60}$$

$$[V] = \begin{bmatrix} [M] & [N] \\ [0] & [P] \end{bmatrix} \tag{61}$$

Analysis of sharp discontinuities ...

$$[\alpha] + [\beta] = /W/ \ /[\eta] + [\gamma]/ \tag{62}$$

$$[\eta] - [\gamma] = /V/ \ /[\alpha] + [\beta]/ \tag{63}$$

are obtained in place of Eqs. (50) - (53). The last two equations give the boundary conditions at the discontinuity. Additional boundary conditions may be introduced. Assuming that the waveguide is fed from side I and side II is loaded one may eliminate (γ) and solve for η and β by α. Calling V_1 and V_2 the incident and reflected voltages Z_k - normalized impedance, Eq.

$$V_2 = -\frac{1 - Z_k}{1 + Z_k} V_1 \tag{69}$$

is obtained which is similar to the equation for the β solution. It allows one to generalize the definition of normalized impedance and to designate a matrix $(Z) = (W)(U)(V)$ the normalized impedance matrix for a waveguide with sharp discontinuity. For this reason, the equivalent circuit may be given composed of an ideal transformer with constant impedance in series with an impedance represen-

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754610004-3"

30566
P/019/61/010/001/001/006
D223/D305

Analysis of sharp discontinuities ...

ting the load in part II of the waveguide. The equations obtained are precise and evaluation of the influence of discontinuity may be done with any degree of accuracy. The formulae are rather complicated and in practice it is worth discussing the approximation problem. The method can also be applied to the case of a wave guide with a discontinuity produced by a distention. The case when the discontinuity is not at Z = 0, but at Z = ℓ is also considered. The author indicates that this method may be applied in other types of problems involving discontinuities. The work has two appendices giving (i) the general theory of infinite matrices with interlacing methods explained and (ii) the derivation of the initial equation for the EM field. There are 3 figures, 1 table and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: N. Marcuvitz, Waveguide handbook. Rad. Lab. Ser. Vol. 10, Nr. 4, 1951; Schelkunoff, Elektromagnetic waves Nr. 4, 1947.

SUBMITTED: May 28, 1960

Card 7/8

30566
P/019/61/010/001/001/006
D223/D305

Analysis of sharp discontinuities ...

Table D - 1.

~~Tablica~~ D—I

column number
~~Numer kolumny~~

	0	1	2	3	4	5	6	7	8
0	0	2	5	9	14	20	27	35	44
1	1	4	8	13	19	26	34	43	
2	3	7	12	18	25	33	42		
3	6	11	17	24	32	41			
4	10	16	23	31	40				
5	15	22	30	39					
6	21	29	38						
7	28	37							
8	36								

~~Numer wiersza~~
row number

Card 8/8

24942
P/019/61/010/002/001/009
D253/D303

9.1923

AUTHOR: Szulkin, P.

TITLE: The general solution of the problem of a radiating slot in a cylinder with an arbitrary cross-section

PERIODICAL: Archiwum elektrotechniki, v. 10, no. 2, 1961, 297-308

TEXT: The author considers certain basic aspects of the theory of slot antennae. Let an infinitely and perfectly conducting cylinder (Fig. 1) have a cross section in the plane x-y by the curve σ (Fig. 2) which is closed and has a continuous curvature. It is assumed that there is such a whole number $m > o$ that an arbitrary straight line, parallel to the x-axis or y-axis intersects the curve σ at m points at the most. A slot of constant width is cut out in the cylinder as shown. The slot is excited in such a manner that the vector of electric field is independent of Z, parallel to the plane (x,y) and tangent to the projection of the cylinder inside the slot. Finally, it is assumed that there are no energy

Card 1/4

sources in the space around the cylinder. Under the above assumption the problem to be analyzed reduces to determining the electromagnetic field satisfying the Maxwell equations in the external to the cylinder space, with given boundary conditions at the cylinder surface and in addition the condition of radiating at infinity. The expression for the vector E becomes under these conditions

$$E = \frac{j}{\omega\varepsilon}\left(1_r \frac{1}{r}\frac{\partial Hz}{\partial\varphi} - 1_\varphi \frac{\partial Hz}{\partial r}\right) \quad (7)$$

At the same time H_2 must satisfy the scalar equation

$$\nabla^2 Hz + k^2 Hz = 0 \quad (8)$$

where $k^2 = \omega^2\mu\varepsilon$. It is known that a field tangent to a three-dimensional surface defines uniquely an electromagnetic field. It is shown that this theorem is valid also for a two-dimensional problem and it follows that the problem of boundary conditions has a unique solution. This is done by assuming certain conditions for function w and that there exist two different functions $v = w_1 - w_2$ (16) and $v^* = w_1^* - w_2^*$ (17) where the asterisk denotes a conjugate

to any point outside the plane σ and the solution is thus unique. Finally it is shown that the solution exists, the author finally obtaining

$$w(P) = -\int_{\sigma} f \frac{\partial w}{\cdots} d\sigma = \int_{\sigma} fW d\sigma$$

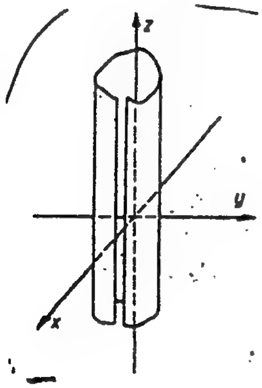
which permits a direct solution of the problem of a radiating slot if the solution of the corresponding diffraction problem is known. For the majority of cross-sections the solution of the diffraction problem could be no less difficult than that of a slot antenna. Nevertheless, the analysis of diffraction of a plane wave, which corresponds to the shifting of P to infinity, leads to direct evaluation of the radiation characteristic of a distant field without the need for evaluating the near field which in some cases may be an advantage. There are 7 figures and 4 references: 1 Soviet-bloc

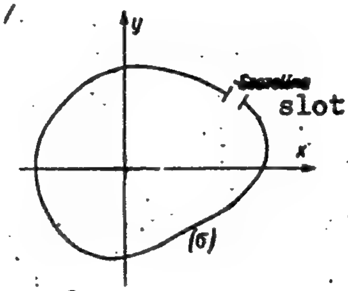
24942
P/019/61/010/002/001/009
D253/D303

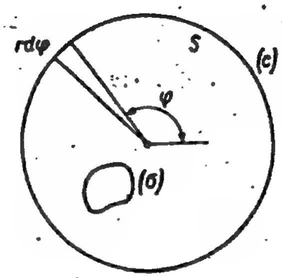
The general solution...

and 3 non-Soviet-bloc. The references to the English-language publications read as follows: E. Jahnke, F. Emde, Tables of functions, Dover, N.Y. 1945; J.A. Stratton, Electromagnetic theory, N.Y. 1941.

SUBMITTED: July 27, 1960







Card 4/4 Fig. 1 Fig. 2 Fig. 3

24943

P/019/61/010/002/002/009
D253/D303

9.1300

AUTHOR: Szulkin, P.

TITLE: The susceptance of a circular diaphragm in a circular wave-guide operating in the TE_{01} mode

PERIODICAL: Archiwum elektrotechniki, v. 10, no. 2, 1961, 309-321

TEXT: The author considers a circular wave-guide operating in the TE_{01} mode and containing a symmetrical diaphragm, whose thickness is assumed to be infinitesimally small and its conductivity infinite (Fig. 1). The diaphragm is, therefore, flat and has a circular symmetry. In these conditions, the higher attenuated modes induced by the discontinuity, can be only the circular electric modes of higher orders and the energy stored will be only magnetic. The diaphragm can thus be represented as a shunt inductance in the analysis of the equivalent transmission line. The problem is analyzed in two formulations. Variational with upper limitation. Using the tangential magnetic field at the diaphragm the expression for a

Card 1/8

24943

P/019/61/010/002/002/009
D253/D303

The susceptance of a circular...

susceptance being the lower limit of real quantity can be derived. The weighting function is taken as having two terms; one is the undistorted current distribution at a diaphragm without the aperture and the second is a correction term. The normalized susceptance which can be used as the upper limit of real values for a circular diaphragm is obtained by means of a tangential electric field in the diaphragm aperture. In this case, two weighting functions are being used. One of them is the sum of the electric field in the aperture when its radius tends to the radius of the waveguide and of a corrective term. The second weighting function has two terms representing the electric field in the aperture. To simplify the problem it is assumed that the diaphragm can be represented as an equivalent lumped parameter in a transmission line. Assuming harmonic time dependence (e^{jwt}) the components of the fields in circular modes can be expressed as

$$E_r = 0$$

$$E\varphi = \frac{J_1\left(\frac{r}{a}\varrho_n\right)}{a\sqrt{\pi}\,J_0(\varrho_n)} V_n(z) = e_n(r)\,V_n(z)$$

Card 2/8

24943

P/019/61/010/002/002/009
D253/D303

The susceptance of a circular...

$$E_z = 0,$$

$$H_r = -\frac{J_1\left(\frac{r}{a}\rho n\right)}{a\sqrt{\pi}J_o(\rho n)} I_n(z) = h_n(r)I_n(z), \qquad (1)$$

$$H\varphi = 0,$$

$$H_z = -\frac{j\eta_o \rho_n J_o\left(\frac{r}{a}\rho n\right)}{ka^2\sqrt{\pi}\,J_o(\rho n)} V_n(z),$$

where

$$e_n(r) = -h_n(r) = \frac{J_1\left(\frac{r}{a}\rho n\right)}{a\sqrt{\pi}J_o(\rho n)},$$

a - the wave-guide radius, $k = \omega\sqrt{\varepsilon_o\mu_o}$ is the wave, ρ_n - nth root of $J_1(x) = 0$; $\eta_o = \sqrt{\frac{\varepsilon_o}{\mu_o}}$ - the admittance of free space. For

Card 3/8

24943

propagation modes the characteristic admittance Y_{cn} and characteristic impedance Z_{cn} are real

$$Y_{cn} = \frac{1}{Z_{cn}} = \frac{\sqrt{k^2 - \left(\frac{\rho n}{a}\right)^2}}{\omega\mu_o} \qquad (3)$$

For attenuated modes both are imaginary and equal

$$Y_{cn} = \frac{1}{Z_{cn}} = \frac{-j\sqrt{\left(\frac{\rho n}{a}\right)^2 - k^2}}{\omega\mu_o} \qquad (4)$$

The problem can be formulated by using the tangential electric field in the aperture or magnetic tangential field at the diaphragm surface. It follows from Eq. (1) that these values are given by

$$E_t = E\varphi(r,z) = \sum_{n=1}^{\infty} e_n(r)V_n(z). \qquad (7)$$

$$H_t = H_r(r,z) = \sum_{n=1}^{\infty} h_n(r)I_n(z).$$

24943

From orthogonality condition and applying the boundary condition that the transverse magnetic field vanishes in the aperture

$$I_1 h_1(r) = -\sum_{n=2}^{\infty} Y_{cn} V_n h_n(r) = \sum_{n=2}^{\infty} Y_{cn} h_n(r) \int_{\sigma} E_{\varphi}(r') h_n(r') d\sigma, \quad (10)$$

is obtained where σ is the aperture area and changing the summing sequence and integration limits. It is assumed that the current at the diaphragm could be expressed by two terms, the first corresponding to current when the aperture tends to vanish, the second being a corrective term. The weighting field is taken as given by the two first terms of a Bessel series

$$H_r(r) = J_1\left(\frac{r}{a}\varrho_1\right) + AJ_1\left(\frac{r}{a}\varrho_2\right) \qquad r_0 \leqslant r \leqslant a \quad . (16)$$

where constant A has to be determined. The variational for the diaphragm is written as

$$\frac{Ba}{Y_{cn}\lambda_g} = \frac{\left[\int\limits_{r_0}^{a} J_1\left(\frac{r}{a}\varrho_1\right)\left\{J_1\left(\frac{r}{a}\varrho_1\right)+AJ_1\left(\frac{r}{a}\varrho_2\right)\right\} r\,dr\right]^2}{\pi J_0^2(\varrho_1)\sum\limits_{n=2}^{\infty}\frac{\left[\int\limits_{r_0}^{a} J_1\left(\frac{r}{a}\varrho_n\right)\left\{J_1\left(\frac{r}{a}\varrho_1\right)+AJ_1\left(\frac{r}{a}\varrho_2\right)\right\} r\,dr\right]^2}{J_0^2(\varrho_n)\sqrt{\varrho_n^2-(ka)^2}}} \qquad (17)$$

Finally expression

$$H_r(r) = J_1\left(\frac{r}{a}\varrho 1\right) + \frac{b_1 - b_0}{b_1 - b_2}\frac{\psi_1}{\psi_2} J_1\left(\frac{r}{a}\varrho 2\right) \qquad (35)$$

is obtained. For variational analysis with an upper limit, two weighting functions are used. The first is the undistorted electric field in the aperture and a corrective factor. Such a field can be expressed by

$$E\varphi(r) = J_1\left(\frac{r}{r_o}\varrho 1\right) + DJ_1\left(\frac{r}{r_o}\varrho 2\right) \quad 0 \leqslant r \leqslant r_o \qquad (36)$$

24913
P/019/61/010/002/002/009
D253/D303

The susceptance of a circular...

This function satisfies the boundary condition of the electric field vanishing along the axis r = 0 and for $r = r_o$

$$\frac{Ba}{Y_{e1}\lambda_g} = \frac{J_0^2(\varrho_1)\sum_2^\infty \sqrt{\varrho_n^2-(ka)^2}\left[\int_0^{r_0} J_1\left(\frac{r}{a}\varrho_n\right)\left\{J_1\left(\frac{r}{r_0}\varrho_1\right)+DJ_1\left(\frac{r}{r_0}\varrho_2\right)\right\}rdr\right]^2}{\pi\left|\int_0^{r_0} J_1\left(\frac{r}{a}\varrho_1\right)\left\{J_1\left(\frac{r}{r_0}\varrho_1\right)+DJ_1\left(\frac{r}{r_0}\varrho_2\right)\right\}rdr\right|^2} \quad (37)$$

is obtained, which after integration reduces to

$$\frac{Bh}{Y_{c1}\lambda_g} = \frac{h_0 + 2gh_1 + g^2h_2}{(1+g)^2} \quad (38)$$

where $g = D\,\frac{J_0(\varrho 2)}{J_0(\varrho 1)}$, $\gamma = \frac{\varrho 2}{\varrho 1}$, $n = \frac{\varrho n \gamma}{\varrho 1}$ (40), (41), (42)

The weighting function of

$$E\varphi(r) = r\sqrt{r_o^2 - r^2} + \varrho r^3 \sqrt{r_o^2 - r^2}. \quad (47)$$

Card 7/8

24943

with a coefficient p corresponding to minimum value of susceptance is then given in the final form of

$$E(r) = \left[1 + \frac{w_1 - w_0}{w_1 - w_2} \frac{J_{5/2}(\varrho_1 r)}{J_{9/2}(\varrho_1 r)} \left(\frac{r}{r_0}\right)^2\right] \frac{r}{r_0} \sqrt{r_0^2 - r^2} \qquad (58)$$

[Abstracter's note: Except for definitions of symbols as given in the abstract, no other symbols are defined in the article]. There are 2 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: N. Marcuvitz, Waveguide Handbook vol. 10, Radiation Lab. Series New York 1951.

SUBMITTED: October 12, 1960

SZULKIN, P.; KACPRZYHSKI, B.

Analysis of passive multimesh electric networks with nonlinear elements. Archiw elektrotech 10 no.2:323-333 '61.

31465
P/019/61/010/004/001/006
D265/D303

9.4210 (1052)

AUTHOR: P. Szulkin

TITLE: Kinematics of electrons in a cavity resonator

PERIODICAL: Archiwum elektrotechniki, v. 10, no. 4, 1961, 799 - 815

TEXT: The author analyzes the motion of a single electron and an electron beam entering axially a cylindrical cavity, for which the mode TE_{11n} is valid and for which the transverse electric field is represented by $\overline{E}(r,\Theta) \sin 2\pi z/\lambda g \cos \omega_0 t$. The equations of motion are represented by

$$\ddot{x} = -\frac{e}{m} E_x - \frac{e}{m} B_0 \dot{y},$$

$$\ddot{y} = -\frac{e}{m} E_y + \frac{e}{m} B_0 \dot{x},$$

Card 1/3

31465
P/019/61/010/004/001/006
D265/D303

Kinematics of electrons ...

$$\ddot{z} = 0, \tag{1}$$

with reference to Fig. 1 where e/m - ratio of the charge to electron mass. Assuming a constant magnetic field B_0 directed along the cavity positive axis Z, equations for the electron path are derived for the three cases of the cyclotron frequency (ω_0) considered in this paper: for $\omega_c = (1 \pm \zeta)\,\omega_0$ and $\omega_c = (1 - \zeta)\,\omega_0$ and $\omega_c = (1 + \zeta)\,\omega_0$ where ω_0 = resonant frequency, $\zeta = \nu_0/\nu_f - \nu_0$ = longitudinal electron velocity and ν_f = phase velocity of the fundamental frequency wave in the resonator. Linear and circular polarization of the electric field is considered and the electron paths are represented as spirals shown projected on the x.y - plane. The physical interpretation of results obtained is discussed and the relationship between the radial deviation of the electron path on the initial phase angle of the electromagnetic field is analyzed. In the second part of this paper the path of the electron beam entering the cavity is discussed and also the path of electrons leaving the cavity, in which they were set in rotary

4

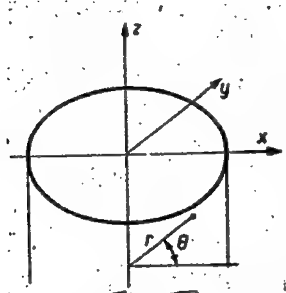
Card 2/3

31465
P/019/61/010/004/001/006
D265/D303

Kinematics of electrons ...

motion agitated by the mode TE_{11n} is described. There are 6 figures.

SUBMITTED: November 11, 1960



~~Rys.~~ Fig. 1

Card 3/3

S/058/62/000/008/105/134
A160/A101

AUTHOR: Szulkin, P.

TITLE: An inductive metal line stretcher in a rectangular waveguide

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1962, 20, abstract 8Zh142 ("Prace Przemysł. inst. telekomun.", no. 35, 1961, 11, 1 - 11, Polish; summaries in Russian, English and French)

TEXT: The effect of a cylindrical-shaped metal obstacle on the wave propagation in a rectangular waveguide is analyzed. Expressions are derived for the individual elements of an equivalent scheme by the variation method.

[Abstracter's note: Complete translation]

Card 1/1

SZULKIN, P.

On the theory of the open resonator. Bul Ac Pol Tech 8 no.11/12: 639-645 '60.

SZULKIN, P.

Radiation of an infinite cylinder of coaxial feed. Przem inst telekom prace 10 no.31:1-13 '60.

P/019/62/011/004/001/010
D271/D308

AUTHOR: Szulkin, P.

TITLE: Radiation of antenna arrays with flat aperture

PERIODICAL: Archiwum Elektrotechniki, v. 11, no. 4, 1962, 707-719

TEXT: The determination of the aperture field required for a given radiation pattern is discussed assuming that the radiation pattern of a first aperture is a Fourier transform of the source distribution in the aperture. The aperture is defined as the effective surface of a radiating antenna and is a part of an inifinite plane (x, z). Analysis is further simplified by assuming the aperture field to be uniform in the z-direction. The field at a distant point E(θ) is expressed as a product of the coefficient of 'obliqueness' and of the space factor S(θ). For a narrow beam along the y-axis (θ = 0), the coefficient of 'obliqueness' becomes a constant and S(θ) gives directly the radiation pattern. The required source distribution A(u) is determined by the equation

Card 1/3

$$A(u) = \int_{-\infty}^{\infty} S(\gamma) e^{-j2\pi u\gamma} d\gamma \qquad (6)$$

where $\gamma = \sin\theta$ and $S(\gamma)$ is the known space factor; when the 'obliqueness' coefficient is constant, the above equation - derived by Fourier transformation of aperture excitation - is strictly valid, otherwise it is only approximate. Some simple explanatory examples are given. An adequate field distribution in an aperture of finite width can produce certain radiation characteristics in an arbitrary, but finite number of directions. The general method of field synthesis in an aperture of given width, adequately approximating the required pattern, can be based either on the superposition of a number of narrow beam characteristics in different directions, or on the representation of the space factor as a product of a transcendental function and a complex polynomial. Both approaches are analyzed, and it is shown that the polynomial method has wider possibilities of synthesis when complex coeffi-